UNIVERSITY OF LEICESTER

Module Specification

PA1110 Mechanics

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	16
Seminars	4
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Mark Lester
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Exam (Final)	70		2		
004	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Mark Lester
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should:

- Be able to state mathematically the laws of classical dynamics, both linear and rotational
- Understand the definitions and use of concepts such as energy, momentum and angular momentum
- Be able to state the properties of linear elasticity (Hooke's law, Young's modulus)
- Be able to state the basic properties of fluids including Archimedes' principle and Bernoulli's theorem
- Be able to give an account of the relation of theory and experiment or observation, in, for example, planetary motion
- Solve relevant problems at an appropriate level using these concepts
- Be able to organise appropriate private study time, obtain new information from text books, communicate physics concepts and ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

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Last Published: 26 June 2017

PA1110 Mechanics

Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA1120 Light and Matter

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	16
Seminars	4
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Richard Willingale
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Final)	70		2		
004	Coursework	30				

Period: Semester 2
Occurrence: E1
Coordinator: Richard Willingale
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Know the simple properties of matter, heat and light, the laws of thermodynamics and the basic laws which describe the behaviour of light
- Know where the basic laws come from and how they are derived
- Know the laws in mathematical form and define all the terms used
- Be able to derive mathematical relationships which describe the properties and behaviour of heat and light
- Be able to solve simple problems involving thermodynamics and optics
- Have gained experience in the use and organization of private study time including background reading, and the discussion of physical ideas and problems with your peers and staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

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Last Published: 26 June 2017

PA1120 Light and Matter

Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA1130 Electricity and Magnetism

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	16
Seminars	4
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Darren Wright
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Final)	70		2		
004	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Darren Wright
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- State mathematically the laws of electric and magnetic fields and the use of related quantities such as field strength, potential, energy, charge and current;
- Solve basic problems in electromagnetism, set out solutions to physics problems correctly and describe experiments and applications in clear, simple prose
- Understand basic circuit theory involving resistors and capacitors and solve basic circuit problems
- Undertake related practical experiments as part of the first year laboratory
- Organise appropriate private study time, obtain new information from text books, communicate physical concepts to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

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Last Published: 26 June 2017

PA1130 Electricity and Magnetism

Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA1140 Waves and Quanta

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	16
Seminars	4
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Matthew Burleigh
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Final)	70		2		
004	Coursework	30				

Period: Semester 2
Occurrence: E1
Coordinator: Matthew Burleigh
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should:

- Be able to state the basic language and equations used to describe oscillations and oscillators; apply this knowledge to solve basic problems in simple harmonic motion, damped simple harmonic motion, forced oscillations and resonance
- Be able to state the basic language and equations used to describe waves, including the 1-D wave equation and harmonic waves; apply this knowledge to solve basic problems in wave propagation, wave superposition (including standing waves and beats), and the non-relativistic Doppler effect
- Be able to demonstrate the need for a quantum theory of matter, as evidenced by the photo-electric effect, UV catastrophe, Compton scattering and electron diffraction
- Be able to demonstrate knowledge of the wave and particle natures of light and matter as described by De Broglie and Heisenberg, including the description of wave functions, expectation values and probability densities
- Be able to state and apply the basic theory of the Bohr atom and quantized electron energy levels, in order to demonstrate the origin of spectral lines
- Be able to organise appropriate private study time, obtain new information from text books, communicate mathematical ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Last Published: 26 June 2017

UNIVERSITY OF LEICESTER

Module Specification

PA1140 Waves and Quanta

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA1601 Introduction to Astrophysics, Modern Physics and Space Science

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Academic Year
Occurrence: E
Coordinator: Matthew Burleigh
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of introductory physics as applied to set specialist fields: astrophysics, modern physics, and space science
- Demonstrate this knowledge by describing and discussing key principles, solving simple applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of introductory specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA1602 Introduction to Applied Physics, Astrophysics and Space Science

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Academic Year
Occurrence: E
Coordinator: Michael Goad
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of introductory physics as applied to set specialist fields: applied physics, astrophysics, and space science
- Demonstrate this knowledge by describing and discussing key principles, solving simple applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of introductory specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA1603 Introduction to Applied Physics, Astrophysics and Modern Physics

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Academic Year
Occurrence: E
Coordinator: Andrew Blain
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of introductory physics as applied to set specialist fields: applied physics, astro physics, and modern physics
- Demonstrate this knowledge by describing and discussing key principles, solving simple applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of introductory specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA1604 Introduction to Applied Physics, Modern Physics and Space Science

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Academic Year
Occurrence: E
Coordinator: Jonathan Nichols
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of introductory physics as applied to set specialist fields: applied physics, modern physics, and space science
- Demonstrate this knowledge by describing and discussing key principles, solving simple applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of introductory specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA1710 Mathematical Physics 1.1

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	25
Seminars	
Practical Classes & Workshops	24
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	101
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Simon Vaughan
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2		
002	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Graham Wynn
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (final)	100				

Intended Learning Outcomes

On successful completion of the module, students should:

- Be able to compute derivatives and integrals for a range of one dimensional functions
- Manipulate vectors, including computing scalar (dot), vector (cross), and triple products and understand their geometrical interpretation
- Derive series expansions for a range of functions using binomial, Maclaurin and Taylor series, and be able to manipulate inverse and hyperbolic trigonometric functions
- Sketch functions of a single variable, paying attention to stationary points and limits, be able to compute limits for simple functions, understand and use the basic properties of finite and infinite series, and their convergence
- Calculate double and triple integrals of simple functions in two or three dimensions, using Cartesian, polar, cylindrical and spherical coordinates
- Recite and use the basic rules of probability theory, recognise and be able to apply some simple probability functions such as the binomial, Poisson and Gaussian distributions, calculate expectation values and variances for random variables
- Be able to organise appropriate private study time, clearly set out solutions to mathematical problems, obtain new information from text books, communicate mathematical ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, electronic practice problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Last Published: 26 June 2017

PA1710 Mathematical Physics 1.1

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA1720 Mathematical Physics 1.2

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	25
Seminars	
Practical Classes & Workshops	24
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	101
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Emma Bunce
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2		
002	Coursework	30				

Period: Semester 2
Occurrence: E1
Coordinator: Emma Bunce
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should:

- Be able to compute partial derivatives for multivariate functions, use Taylor series and find stationary points for multivariate functions
- Recognise types of differential equation, select and apply basic methods for solving first and second order ordinary differential equations with real or complex coefficients, including applying boundary conditions
- Manipulate complex numbers, express complex numbers in terms of their modulus and argument, and interpret these geometrically using the Argand diagram, use complex numbers to simplify trigonometric identities
- Manipulate simple matrices, use matrices to solve systems of linear equations, recognise symmetric and antisymmetric matrices and identity matrices, compute matrix inverses and determinants for 2x2 and 3x3 matrices, find eigenvalues and eigenvectors for 3x3 matrices
- Understand how simple AC circuits can be modelled mathematically using differential equations and complex numbers, use phasors and complex impedance to study simple circuits, recognise and compute the basic properties of a resonance
- Be able to organise appropriate private study time, clearly set out solutions to mathematical problems, obtain new information from text books, communicate mathematical ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, electronic practice problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Last Published: 26 June 2017

PA1720 Mathematical Physics 1.2

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA1900 Experimental Physics 1

Academic Year: 2017/8
Module Level: Year 1
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	6
Seminars	
Practical Classes & Workshops	78
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	66
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Academic Year
Occurrence: E
Coordinator: Darren Wright
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Core Lab (Final)	45				
002	Group Research Projects	45				
003	Computing	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Plan and execute laboratory experiments and set up simple equipment following outline instructions
- Comply fully with Departmental safety procedures
- Use standard laboratory equipment competently
- Analyse data appropriately, including errors analyses associated with measurements
- Plan, record and report simple investigations professionally
- Write simple computer programs
- Participate in problem-based learning projects
- Organise appropriate private study time, obtain new information from text books, communicate ideas to your peers and to staff
- Work effectively in teams

Teaching and Learning Methods

In this module teaching and learning will be achieved through preparatory skills sessions, handbooks and experiment scripts, interactive demonstrations, problem-based learning projects, R programming workshops and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Learning:Indicative Actvities

You will be required to prepare for each experiment before starting it by reading up on the topic, answering some preparatory questions and planning the experiments. Plotting and analysis will be required outside of core lab hours.

UNIVERSITY OF LEICESTER

Module Specification

PA2230 Condensed Matter

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	24
Seminars	3
Practical Classes & Workshops	8
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	115
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Final)	70		2		
004	Coursework	30				

Period: Semester 2
Occurrence: E1
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Be able to sketch simple crystal structures adopted by solid materials; perform simple calculations relating to crystal structures
- Be able to describe simple models for lattice vibrations
- Be able to state and apply the laws governing the behaviour of electrons in various condensed matter environments including metals, insulators, semiconductors and superconductors
- Be able to organise appropriate private study time, obtain new information from text books, communicate mathematical ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, small group tutorial classes, workshops, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

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Last Published: 26 June 2017

PA2230 Condensed Matter

Guided Independent Learning:Indicative Actvities

You will work through the course, including working through the example problems, and practice problems. You will discuss problems and solutions wih your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA2240 Electromagnetic Fields

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	24
Seminars	3
Practical Classes & Workshops	8
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	115
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Timothy Yeoman
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Final)	70		2		
004	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Timothy Yeoman
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Be able to solve problems involving the electric field and electric displacement, the magnetic field and magnetic intensity, polarisation and magnetisation
- State mathematically the integral and differential forms of Maxwell's equations
- Be able, to use Maxwell's equations to derive the wave equation for electromagnetic (EM) waves, to solve basic problems in electromagnetism and wave propagation in a vacuum, in dielectric media and in conductors
- Be able to solve problems involving calculations of electromagnetic energy density and electromagnetic energy propagation
- Be able to define and derive the boundary conditions for EM waves at boundaries
- Be able to derive the reflection and transmission coefficients of EM waves, and solve problems involving waves at boundaries under a number of geometries
- Be able to organise appropriate private study time, obtain supplementary information from text books to consolidate your understanding, and communicate the physical principles underlying Maxwell's equations and electromagnetic waves to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Last Published: 26 June 2017

PA2240 Electromagnetic Fields

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material. As part of your revision you should work through the past papers provided on blackboard and make reference to your course handouts and the numerical answers provided to ensure you have mastered the subject.

UNIVERSITY OF LEICESTER

Module Specification

PA2260 Relativity, Quantum Physics and Particles

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	24
Seminars	3
Practical Classes & Workshops	8
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	115
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Matthew Burleigh
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	30				
002	Examination (Final)	70		2		

Period: Semester 1
Occurrence: E1
Coordinator: Matthew Burleigh
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Be able to state the concepts developed in Einstein's theory of Special Relativity, and apply basic formulae, including the Lorentz transforms, to predict behaviour in physical situations where velocities are high; use the energy-momentum relationship to solve problems involving the collision of relativistic particles; explain the principles underlying the General Theory of Relativity
- Be able to describe the wave-like properties of matter at the quantum level; state the time dependent and time-independent Schrödinger equations; be able to solve simple 1-dimensional problems involving infinite and finite wells and barriers, including the calculation of expectation values and probability densities; use the De Broglie relations and Uncertainty principle to estimate physical properties in quantum systems
- Be able to demonstrate knowledge of the basic concepts of the Standard Model of particle physics, including stating the properties of elementary particles such as leptons and quarks; use the conservation laws to deduce whether a decay or reaction is allowed; be able to explain how quarks combine to form hadrons and mesons; be able to state the properties and use appropriate mathematical descriptions of Fermions and Bosons
- Be able to organise appropriate private study time, obtain new information from text books, communicate complex ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Last Published: 26 June 2017

PA2260 Relativity, Quantum Physics and Particles

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will work through the set problems, including working through examples, and practice problems in textbooks that cover the requisite material. You will discuss problems and solutions with your peers, and review texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA2601 Intermediate Astrophysics and Modern Physics

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Michael Goad
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Astrophysics Coursework (Final)	50				
002	Modern Physics Coursework	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Demonstrate a working knowledge of intermediate physics as applied to set specialist fields: astrophysics, and modern physics
- Demonstrate this knowledge by describing and discussing key principles, solving applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of intermediate specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA2602 Intermediate Applied Physics and Astrophysics

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Applied Physics Coursework (Final)	50				
002	Astrophysics Coursework	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of intermediate physics as applied to set specialist fields: applied physics, and astrophysics
- Demonstrate this knowledge by describing and discussing key principles, solving applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of intermediate specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA2603 Intermediate Astrophysics and Space Science

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Thomas Stallard
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Astrophysics Coursework (Final)	50				
002	Space Science Coursework	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of intermediate physics as applied to set specialist fields: astrophysics, and space science
- Demonstrate this knowledge by describing and discussing key principles, solving applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of intermediate specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA2604 Intermediate Modern Physics and Space Science

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Stephen Milan
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Modern Physics Coursework (Final)	50				
002	Space Science Coursework	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of intermediate physics as applied to set specialist fields: modern physics, and space science
- Demonstrate this knowledge by describing and discussing key principles, solving applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of intermediate specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

Last Published: 26 June 2017

UNIVERSITY OF LEICESTER

Module Specification

PA2605 Intermediate Applied Physics and Space Science

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Applied Physics Coursework (Final)	50				
002	Space Science Coursework	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of intermediate physics as applied to set specialist fields: applied physics and space science
- Demonstrate this knowledge by describing and discussing key principles, solving applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of intermediate specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

UNIVERSITY OF LEICESTER

Module Specification

PA2606 Intermediate Applied Physics and Modern Physics

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	30
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	120
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Applied Physics Coursework (Final)	50				
002	Modern Physics Coursework	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate a working knowledge of intermediate physics as applied to set specialist fields: applied physics, and modern physics
- Demonstrate this knowledge by describing and discussing key principles, solving applied problems and compiling written reports
- Organise appropriate private study time, obtain new information from text books, communicate areas of intermediate specialist physics to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will read relevant background material and work through appropriate problems. You will discuss problems and solutions with your peers.

Last Published: 26 June 2017

UNIVERSITY OF LEICESTER

Module Specification

PA2710 Mathematical Physics 2

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	15
Seminars	3
Practical Classes & Workshops	14
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	118
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2		
002	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should:
- Be able to solve basic second order partial differential equations; be able to describe physical systems mathematically using second order partial differential equations; use the method of separation of variables
- Apply standard solutions of the wave equation on finite and infinite strings; apply the wave equation to calculate reflection and transmission of waves at barriers
- Be able to calculate Fourier series and transforms of 1-dimensional functions; know or be able to derive, the formulae for Fourier series coefficients; be able to apply the Fourier formulae to obtain Fourier series coefficients and use these to solve equations
- Use knowledge of symmetry to know when to apply sine, cosine and full range series; be able to calculate Fourier transforms, and to apply the convolution principle
- Be able to state the properties of, and use, the vector calculus operators grad, curl and div in 3-dimensional problems; state Gauss' and Stokes' theorems and know how these relate to flux and circulation
- Solve simple physical problems using Gauss' and Stokes' theorems; be able to manipulate partial derivatives
- Be able to organise appropriate private study time, clearly set out solutions to mathematical problems, obtain new information from text books, communicate mathematical ideas to your peers and to staff

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Last Published: 26 June 2017

PA2710 Mathematical Physics 2

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

You will work through the course text, including working through the example problems and practice problems. You will discuss problems and their solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA2720 Statistical Physics

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	24
Seminars	3
Practical Classes & Workshops	8
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	115
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator:
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2		
002	Coursework	30				

Period: Semester 2
Occurrence: E1
Coordinator:
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Use the thermodynamic potentials to obtain relationships between these and other thermodynamic variables, and use the Maxwell relations
- Be able to derive the three distribution functions appropriate to fermions, bosons and classical particles; use the partition function to obtain the properties of simple systems
- Be able to describe mathematically and solve problems involving electrons in the free electron gas
- Be aware of, and be able to solve simple problems involving the magnetic properties of matter
- Be able to organize appropriate private study time; obtain new information from text; apply mathematical techniques to solving problems in statistical physics; be able to discuss basic physics and ideas with your peers and staff; be able to set out solutions to problems clearly and correctly

Teaching and Learning Methods

In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Last Published: 26 June 2017

PA2720 Statistical Physics

Guided Independent Learning:Indicative Actvities

You will work through the set problems, including working through examples, and practice problems in textbooks that cover the requisite material. You will discuss problems and solutions with your peers, and review texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

PA2900 Experimental Physics 2

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 30

Student Workload (hours)

Lectures	8
Seminars	
Practical Classes & Workshops	91
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	201
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	300

Period: Academic Year
Occurrence: E
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Core Physics Experiments	50				
002	Group Research Projects (Final)	20				
003	Scientific Inference and Computing	20				
004	Electronics Workshop	10				

Intended Learning Outcomes

On successful completion of the module, students should:
- Be able to plan, set up and conduct laboratory experiments following outline instructions; manage simple scientific projects
- Be able to comply fully with Departmental safety procedures; use standard laboratory equipment competently
- Be able to explain aspects of the scientific method, types of logical reasoning and data analysis, and be able to critically analyse statistical and scientific arguments
- Understand types and sources of errors, data quality, and be able to apply error transformations where appropriate
- Produce and interpret common quantitative and graphical statistical summaries using simple, custom computer programs
- Be able to plan and report complex investigations; work effectively in teams
- Be able to design, construct and test a simple electronic circuit; describe how basic electronic components work; determine critical circuit parameters (e.g. RC filters, feedback etc.)

Teaching and Learning Methods

In this course you will benefit from induction lectures, supervised laboratory classes, supervised computing workshops, data handling lectures, group and individual reports, discussions with peers and staff members, and guided independent study.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Learning:Indicative Actvities

You will work through the relevant parts of the laboratory scripts prior to arriving in the laboratory session. You will analyse your experimental data, and present it in group or individual reports. You will discuss results with your peers, and compare with results from the literature and elsewhere if relevant.

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Module Specification

PA2980 Experimental Physics 1

Academic Year: 2017/8
Module Level: Year 2
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	2
Seminars	
Practical Classes & Workshops	56
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	92
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Steve Baker
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- plan and execute simple laboratory experiments
- set up standard equipment following outline instructions
- comply fully with Departmental safety procedures
- use a range of standard laboratory equipment competently
- analyse errors associated with measurement
- plan and report simple investigations
- write simple computer programs to analyse and plot data
- design, construct and test a simple electronic circuit, describe how basic electronics components work; determine critical circuit parameters.

Teaching and Learning Methods

Lectures, Preparatory skills sessions, supervised laboratory activity, computer workshop classes, electronics workshop.

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Learning:Indicative Actvities

You will be required to prepare for each experiment before starting it by reading up on the topic, answering some preparatory questions and planning the experiments. A limited amount of plotting and analysis may be required outside of core lab hours.

UNIVERSITY OF LEICESTER

Module Specification

PA3210 Quantum Mechanics

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	20
Seminars	4
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	78.5
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	112.5

Period: Semester 1
Occurrence: E
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Summer) (Final)	70		3		
004	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				Y

Last Published: 26 June 2017

UNIVERSITY OF LEICESTER

Module Specification

PA3210 Quantum Mechanics

Intended Learning Outcomes

At the end of this module students should be able to give an account of the origins of the Schrodinger equation and the relation between theory and experiment in, for example, atomic spectra, and the Stern-Gerlach experiment; calculate the solutions to the time independent Schrodinger equation for simple problems including infinite and finite wells and barriers, harmonic oscillators, and hydrogen-like atoms; state mathematically the laws of quantum mechanics and the definitions and use of related quantities such as energy, momentum and angular momentum and their corresponding operators; be able to use the matrix formulation of quantum mechanics and to solve basic problems involving Pauli spin matrices; calculate the energy level splittings arising from spin-orbit coupling and Zeeman splitting; caculate approximate analytical solutions to the time independent Schödinger equation using first order perturbation theory and the variational method.

The course is taught from a set text: Quantum Mechanics, 5th Edition, A.I.M. Rae (Taylor and Francis).

The detailed syllabus is as follows:

Unit 1 - Foundations of quantum mechanics (Rae chapters 1 and 2): photoelectric effect, Compton effect ,atomic spectra; De Broglie waves, uncertainty principle; one-dimensional Schrödinger equation; particle in square-well potential, quantum mechanical tunnelling; the harmonic oscillator.

Unit 2 - The hydrogen atom (Rae chapter 3): the Schrödinger equation in 3-dimensions; the Schrödinger equation in spherical polar coordinates, solution by separation of variables, angular quantum numbers; the hydrogen atom, radial equation and principal quantum numbers, hydrogen-like atoms.

Unit 3 - Postulates of quantum mechanics, operators and angular momentum (Rae chapters 4,5 and 6); wave functions, dynamical
variables and operators (4.1, 4.2); eigenstates, eigenvalues, eigenfunctions, Hermitian operators and orthogonality (4.2); probability distributions, expectation values (4.3); commutation relations, compatibility (4.4), uncertainty principle (4.5), degeneracy (4.7); angular momentum operators (5.1); their eigenvalues and eigenfunctions (5.2); measurement of angular momentum, Stern-Gerlach experiment (5.3); matrix representation (6.1), spin matrices (6.2), quantum theory of measurement (6.3).

Unit 4 - Application to atomic physics and approximate methods (Rae chapters 6 and 7): Dirac notation (6.5); addition of angular momenta (6.4), spin-orbit coupling and the Zeeman effect (6.5); Time-independent perturbation theory: non-degenerate energy levels (7.1), anharmonic oscillator and polarizability of hydrogen (7.1); Perturbation of degenerate levels, electrons in solids (7.2); The variational principle and applications (7.3).

Teaching and Learning Methods

Lectures, Set text (Quantum Mechanics, A.I.M. Rae), Example problems, Problem solving group workshops and seminars

Assessment Methods

Multiple choice problems, Short test problems; written recall of basic knowledge; graded written examination problems (Section A: 4 short questions: basic knowledge. Section B: 3 from 6 questions: problem solving and applications)

Pre-Requisites

PA2230, PA2240, PA2710 and PA2720 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3220 Atoms and Nuclei

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	20
Seminars	4
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	78.5
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	112.5

Period: Semester 2
Occurrence: E
Coordinator: Michael Goad
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
003	Examination (Final)	70		3		
004	Coursework	30				

Period: Semester 2
Occurrence: E1
Coordinator: Michael Goad
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				Y

Intended Learning Outcomes

Student should be able to understand the origin of atomic quantum numbers and the periodic table; interpret the spectra of hydrogen, alkali metals, helium and other many electron atoms; explain the Zeeman effect and other spectroscopic phenomena; demonstrate a quantitative knowledge of the properties of atomic nuclei, explain these properties on the basis of the liquid drop and shell models; understand the mechanisms of radioactive decay and other nuclear reactions; demonstrate a basic understanding of the principles of fission, fusion and nuclear power.

Teaching and Learning Methods

Set Text, Lectures, Example problems, Problem solving group workshops, Small groups

Assessment Methods

Multichoice problems, Short test problems; written recall of basic knowledge; graded written examination problems (Section A: 4 short questions: basic knowledge. Section B: do 3 from 6 questions: problem solving and applications); marked group work; marked problems

Pre-Requisites

PA2230, PA2240, PA2710 and PA2720 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3230 Radiation and Matter

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 10

Student Workload (hours)

Lectures	15
Seminars	1
Practical Classes & Workshops	8
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	51
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	75

Period: Semester 1
Occurrence: E
Coordinator: Graham Wynn
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2		
002	Coursework	30				

Period: Semester 1
Occurrence: E1
Coordinator: Graham Wynn
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				Y

Intended Learning Outcomes

At the end of this module, typical students should be able to: use thermodynamic potentials to describe physical systems; discuss thermodynamic equilibrium in terms of availability; derive and apply the Clausius-Clapeyron relation for phase boundaries; explain the thermodynamics of blackbody radiation; derive the Planck function and its properties; be able to define and use the absorption and emission coefficients of a material; derive and apply the radiative transfer equation; solve problems involving thermal radiation and blackbody radiation, including the Kirchoff laws, Wien's law and Stefan's law; be able to describe laser action and solve problems involving basic laser design and use.

Students should be able to break down problems involving the material covered in the course in order to identify its essential elements, implement a planned solution, evaluate the solution and reflect upon it.

Teaching and Learning Methods

Lectures, example problems, problem solving group workshops, small group problem classes, marked work, group work.

Assessment Methods

The course will be assessed by means of group problem solving workshops (10% engagement mark), an electronic term test (20%) and a 2 hour final examination (70%).

Pre-Requisites

PA2230, PA2240, PA2710 and PA2720 or equivalent

Co-Requisites

Excluded Combinations

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Last Published: 26 June 2017

PA3230 Radiation and Matter

Guided Independent Learning:Indicative Actvities

Module Specification

PA3240 Skills Elective

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 10

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	24
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	51
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	75

Period: Semester 1
Occurrence: E
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

In this course students will gain experience in computational, experimental, data analysis, project management or pedagogy appropriate to careers in research, industry or education. Students select from group industry, group business and group education projects, Python, Numerical Methods in C, Electronics, Astrodynamics, Introduction to Physics in Education, and Lean LaunchPad: Evidence Based Entrepreneurship.
At the end of this module typical students should be able to apply computational, experimental or practical techniques in an applied area of physics appropriate to careers in research, education and industry (e.g. advanced programming, data analysis, pedagogy, project management) and be able to demonstrate new skills on the basis of their experience. Students should be able to apply the skills obtained to solve problems in novel situations, clearly explain their approach to solving the problem given, describe alternative approaches to problem solving and determine the relative merits of each. Typical students should be able to work effectively in a team. Students should be able to present the results of an investigation into a problem clearly in written report and oral presentation form.

Teaching and Learning Methods

Supervised activity, induction session, handbooks, interactive supervision

Assessment Methods

The assessment for PA3240 is 100% coursework. Assessment may be by progress, report, presentation, or any combination of these.
For group projects the assessment will be via an individual progress mark (30%), a group report mark (50%) and a group presentation mark (20%). For Python, the assessment will be via tasks signed off during workshops and quality of code written. For Numerical Methods in C, the assessment will be via tasks signed off during workshops and quality of lab book produced. For Electronics the assessment is via group progress (25%), written report (50%), and personal performance (25%). For Astrodynamics the assessment will be via progress made during workshops and final presentation. For Introduction to Physics in Education the assessment will be via reflective journal (40%), presentation (20%) and pedagogical content of prepared lesson (40%). For Lean LaunchPad: Evidence Based Entrepreneurship the assessment will be on progress including weekly presentations (30%), Interim Report (10%), final presentation (10%), and final report (50%).

Pre-Requisites

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3240 Skills Elective

UNIVERSITY OF LEICESTER

Module Specification

PA3250 Mathematical Physics 3

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 10

Student Workload (hours)

Lectures	8
Seminars	
Practical Classes & Workshops	10
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	57
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	75

Period: Semester 1
Occurrence: E
Coordinator: Sergei Nayakshin
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	30				
002	Examination (Summer) (Final)	70		2		

Period: Semester 1
Occurrence: E1
Coordinator: Sergei Nayakshin
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

At the end of this module, typical students should be able to describe and discuss the underlying principles of vector calculus and Fourier transforms and apply these to solving set problems in a physical context. Students should be able be able to set out solutions to mathematical physics problems clearly and correctly.

Teaching and Learning Methods

Introductory lectures, group work and private study through course booklet.

Assessment Methods

This module is taught from a specially prepared text. Set problems are assessed during workshops and a test.

Pre-Requisites

PA2710 and PA2720 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3280 Physics Challenge

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 10

Student Workload (hours)

Lectures	1
Seminars	5
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	69
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	75

Period: Semester 2
Occurrence: E
Coordinator: Andrew King
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	50		3		
002	Coursework	50				

Intended Learning Outcomes

At the end of this module, typical students should be able solve general problems using basic knowledge of core physics. The course requires solution of general problems in physics requiring a knowledge of the content of first and second year core courses in different contexts. Problems are solved in groups and solutions presented in written and oral form. At the end of the course typical students should also be able to communicate scientific points clearly, work effectively in groups and present solutions to problems with confidence.

Teaching and Learning Methods

Group problem solving and presentations

Assessment Methods

Oral presentations, submitted group work, examination

Pre-Requisites

PA1110, PA1120, PA1130, PA1140, PA1710, PA1720, PA2230, PA2240, PA2710, PA2720, PA3210 or equivalent.

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3600 Physics Speciality Electives 3

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 30

Student Workload (hours)

Lectures	52
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	173
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	225

Period: Semester 1
Occurrence: E1
Coordinator:
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Period: Academic Year
Occurrence: E
Coordinator:
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Semester 1 options) (Final)	50		2.5		
002	Examination (Semester 2 options) (Final)	50		2.5		

Intended Learning Outcomes

At the end of this module, typical students should be able to demonstrate a working knowledge of advanced physics in a number of specialist fields of their choice. Students should be able to demonstrate this knowledge by describing and discussing key principles in the fields of choice, solving applied problems and compiling written reports based on the scientific literature.

Teaching and Learning Methods

Lectures, example problems, workshops, marked work.

Assessment Methods

The course will be assessed by means of problems/essays.

Pre-Requisites

PA2230, PA2240, PA2710, PA2720 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3652 Physics Electives 2 (Study Abroad)

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	112.5
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	112.5

Period: Semester 2
Occurrence: E
Coordinator: Graham Wynn
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Departmental Examination (Final)	100		2.5		

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UNIVERSITY OF LEICESTER

Module Specification

PA3900 Workshops and Projects 3

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 30

Student Workload (hours)

Lectures	2
Seminars	
Practical Classes & Workshops	24
Tutorials	
Fieldwork	
Project Supervision	15
Guided Independent Study	184
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	225

Period: Academic Year
Occurrence: E
Coordinator: Nial Tanvir
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100		0		

Intended Learning Outcomes

Relevant artifact (Computer program, practical demonstration, teaching materials etc.) Research report.
Students should be able to carry out an original investigation under supervision.
Students should be able to apply computational or experimental techniques in a research area and/or be able to develop further new skills on the basis of their experience of learning.
Students should be able to clearly explain their approach to solving the problems, apply the skills obtained to novel situations, describe alternative approaches to problem solving and determine the relative merits of each.

Teaching and Learning Methods

Supervised activity, induction session, handbooks, interactive supervision

Assessment Methods

Assessed project report and presentation, task-based.

Pre-Requisites

PA2900 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA3970 Workshops and Projects 3 (Study Abroad)

Academic Year: 2017/8
Module Level: Year 3
Scheme: UG
Department: Physics and Astronomy
Credits: 20

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	

Period: Semester 2
Occurrence: E
Coordinator: Graham Wynn
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Last Published: 26 June 2017

UNIVERSITY OF LEICESTER

Module Specification

PA4440 Advanced Study Project

Academic Year: 2017/8
Module Level: Year 4
Scheme: UG
Department: Physics and Astronomy
Credits: 20

Student Workload (hours)

Lectures	1
Seminars	3
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	10
Guided Independent Study	136
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Sergei Nayakshin
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Report (Final)	50		0		
002	Presentation	50				

Intended Learning Outcomes

Preparation of a research portfolio comprising: a brief abstract of the topic; a brief review of how the material was gathered; a list of works studied with short notes on each and follow-up references; outline notes for a short course of lectures; detailed notes for a single 40 minute lecture including suggested problems and follow-up references. Preparation of a research presentation at 3rd year/beginning graduate level lasting about 40 minutes with 5 minutes for questions. Preparation for responding to questions akin to those expected after a research seminar.

Teaching and Learning Methods

Introductory lecture; individual guidance via module supervisor

Assessment Methods

Portfolio intellectual content assessed by Supervisor. Presentation assessed by two other staff members according to a criterion-based scheme.

Pre-Requisites

PA3210, PA3220, PA3230 and PA3250 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA4480 Advanced Core Physics 1

Academic Year: 2017/8
Module Level: Year 4
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	25
Seminars	
Practical Classes & Workshops	6
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	81.5
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	112.5

Period: Semester 1
Occurrence: E
Coordinator: Simon Vaughan
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam (Final)	35		2.5		
002	Scientific Inference Coursework	50				
003	Dynamical Systems Coursework	15				

Period: Semester 1
Occurrence: E1
Coordinator: Simon Vaughan
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

At the end of this module, typical students should be able to demonstrate a working knowledge of advanced physics in areas such as dynamical systems and scientific data analysis. Students should be able to demonstrate this knowledge by describing and discussing advanced concepts in the fields of choice, applying analytical and computational techniques to advanced problems and compiling written reports based on the scientific literature.

Teaching and Learning Methods

Lectures, example problems, problem solving workshops, computational workshops, marked work.

Assessment Methods

The module will be assessed by means of coursework and exam.

Pre-Requisites

PA3210, PA3220, PA3230 and PA3250 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

Last Published: 26 June 2017

Module Specification

PA4600 Speciality Options 4

Academic Year: 2017/8
Module Level: Year 4
Scheme: UG
Department: Physics and Astronomy
Credits: 30

Student Workload (hours)

Lectures	68
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	157
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	225

Period: Academic Year
Occurrence: E
Coordinator: Graham Wynn
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	30				
002	Examination (Summer) (Final)	70		5		

Intended Learning Outcomes

At the end of this module, typical students should be able to demonstrate a working knowledge of advanced physics in a number of specialist research fields of their choice. Students should be able to demonstrate this knowledge by describing and discussing advanced concepts in the fields of choice, applying analytical and computational techniques to advanced problems and compiling written reports based on the scientific literature.

Teaching and Learning Methods

Lectures, example problems, workshops, marked work.

Assessment Methods

The module will be assessed by means of coursework (30%; e.g. problem sets, reports) and final examinations (70%).

Pre-Requisites

PA3210, PA3220, PA3230, PA3250 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA4630 Advanced Core Physics 2

Academic Year: 2017/8
Module Level: Year 4
Scheme: UG
Department: Physics and Astronomy
Credits: 15

Student Workload (hours)

Lectures	28
Seminars	
Practical Classes & Workshops	4
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	80.5
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	112.5

Period: Semester 2
Occurrence: E
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam (Final)	70		2.5		
002	Quantum Theory of Solids Coursework	15				
003	Further Radiation and Matter Coursework	15				

Period: Semester 2
Occurrence: E1
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

At the end of this module, typical students should be able to demonstrate a working knowledge of advanced physics in areas such as quantum theory of solids and further radiation and matter. Students should be able to demonstrate this knowledge by describing and discussing advanced concepts in the fields of choice, applying analytical and computational techniques to advanced problems and compiling written reports based on the scientific literature.

Teaching and Learning Methods

Lectures, example problems, problem solving workshops, marked work.

Assessment Methods

The module will be assessed by means of coursework (30%; e.g. problem sets, reports) and final examinations (70%).

Pre-Requisites

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA4970 Specialist Research Project

Academic Year: 2017/8
Module Level: Year 4
Scheme: UG
Department: Physics and Astronomy
Credits: 30

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	

Period: Academic Year
Occurrence: E
Coordinator: Nial Tanvir
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100		0		

Intended Learning Outcomes

Relevant artifact (Computer program, practical demonstration, research knowledge etc) Research report. Students should be able to carry out an original investigation, individually under supervision. Students should be able to apply computational, experimental or analysis techniques to solve a problem in an area of research. Students should be able to clearly communicate their findings.

Teaching and Learning Methods

Supervised activity. Induction session, handbooks, interactive supervision..

Assessment Methods

Assessed project report and presentation, task-based.

Pre-Requisites

PA3900 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities

UNIVERSITY OF LEICESTER

Module Specification

PA4980 Physics Special Topics

Academic Year: 2017/8
Module Level: Year 4
Scheme: UG
Department: Physics and Astronomy
Credits: 10

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	
Demonstration	
Supervised time in studio/workshop	
External Visits	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	

Period: Semester 1
Occurrence: E
Coordinator: Mervyn Roy
Mark Scheme: UG Pass for Credit

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100		0		

Intended Learning Outcomes

In this course students gain experience as researchers, authors, referees of scientific papers, and editors of a scientific journal by producing the department's own Journal of Physics Special Topics.
At the end of this module typical students should be able to: formulate and research new quantitative physics problems; write concise scientific articles and referee reports; communicate scientific results to peers and to the press; understand the formal processes (authoring, reviewing and editing) involved in scientific publishing; use the open journal systems journal management and publishing software; manage their own study time work effectively in teams.

Teaching and Learning Methods

Students act as authors, referees and editors of a scientific journal. Students are organized into research groups of about 4. Each group will produce short scientific papers on original physics problems. The level of the problems and the material in the submitted papers should correspond roughly to that in a physics challenge problem. To help formulate and solve new problems the groups are given access to 'seed' papers written by staff and to student articles that have already been published in previous issues of the Journal of Physics Special Topics.
Submitted papers are given to other groups to referee. The referees respond with a short report detailing errors and corrections, or acceptance to the journal. The referee reports are then reviewed by an editorial board consisting of members of each student group who have the final say on publication in the journal.
The overall objective for each group is to publish as many good scientific papers as possible.

Assessment Methods

The assessment for P4980 is 100% coursework. The final module percentage for each student group is calculated according to the quantity and quality of accepted publications in the course journal, the overall quality of referee reports and board meetings, and the student group ranking. The group ranking is derived from each group's awarded journal points. These are awarded for submission, publication, and referee reports.

Pre-Requisites

PA3210, PA3220, PA3230 and PA3250 or equivalent

Co-Requisites

Excluded Combinations

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Guided Independent Learning:Indicative Actvities